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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/971,707	10/09/2001	Taku Takeishi	214699US0CONT	4265

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EXAMINER	
THOMPSON, CAMIE S	

ART UNIT	PAPER NUMBER
1774	

DATE MAILED: 12/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/971,707	TAKEISHI ET AL.	
	Examiner	Art Unit	
	Camie S Thompson	1774	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Amendment filed on August 27, 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3&8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Applicant's amendment and accompanying remarks filed August 27, 2003 have been acknowledged.

2. Examiner acknowledges amended claims 2, 12-13, 18 and 20.

3. The objection of claim 9 as being a duplicate of instant claim 3 is withdrawn due to amended claim 3.

4. The rejection of claims 1, 3, 5-10, 12-14 and 21-25 under 35 U.S.C. 102(b) as being anticipated by Nunomura et al., U.S. Patent Number 4,757,235 is withdrawn due applicant's argument.

5. The rejection of claims 1-2, 4 and 11 under 35 U.S.C. 103(a) as being unpatentable over Nunomura et al., U.S. Patent Number 4,757,235 in view of JP 06-084692 is withdrawn due to applicant's argument.

6. The rejection of claims 17-19 under 35 U.S.C. 103(a) as being unpatentable over Nunomura et al., U.S. Patent Number 4,757,235 in view of Chung, U.S. Patent Number 5,352,622 is withdrawn due to applicant's argument.

7. The rejection of claims 15-16 and 20 under 35 U.S.C. 103(a) as being unpatentable over Nunomura et al., U.S. Patent Number 4,75,235 in view of Arai et al., U.S. Patent Number 6,340,537 is withdrawn due to applicant's argument.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujaski et al., U.S. 5,065,275.

Fujaski discloses a composite multilayer substrate comprising an electrode and dielectric layer formed on an electrically insulating substrate wherein the substrate has a coefficient of thermal expansion of 10.5 to 12.4 ppm/K as per instant claim 1 (see Figure 6, column 1, lines 33-49 and column 4, lines 1-68, and Table 1). The reference also discloses that the substrate is mainly composed of magnesia and the dielectric layer is mainly composed of barium titanate as per instant claims 2 and 3 (see column 4, lines 1-29 and column 3, lines 61-68). Claim 1 of the reference discloses that the dielectric layer is composed of a ceramic composition comprising $MTiO_3$ wherein in M represents on or several of Ba, Ca, Mg, La, Sr and Nd as per instant claims 4 and 5.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-3, 6-14 and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nunomura et al., U.S. Patent Number 4,757,235 in view of Fujaski et al., U.S. Patent Number 5,065,275.

Nunomura discloses an electroluminescent display device wherein the substrate portion comprises a ceramic base with internal wiring electrodes with a first insulating layer on a substrate with embedded electrodes as per instant claim 1 (see column 12, lines 55-63 and Figure 9). The reference also discloses that barium titanate may be used in the dielectric layer as per instant claims 3 and 9 (see column 8, lines 32-35). Column 13, lines 11-32 of the reference disclose a substrate having embedded electrodes with a first insulating layer, a luminescent layer on top of the first insulating layer, a second insulating layer with a second electrode layer on top of the second insulating layer as per instant claims 7 and 8. The internal electrodes may be made of silver (Ag) or a silver-palladium (Ag-Pd) alloy as per instant claims 12 and 13 (see column 6, lines 60-61). Column 8, lines 33-35 of the reference also discloses that the insulating dielectric layer may contain silicon oxide (SiO_2) as per instant claim 6. Nunomura discloses in column 13, lines 25-32 that the second electrode may be ITO as per instant claim 14. A transparent ITO electrode has a resistivity of up to 1 ohm cm is a physical property of the electrode and is therefore inherent. Additionally in column 13, it is disclosed that zinc sulfide is used as the

luminescent layer as per instant claims 23-25. Nunomura does not disclose the coefficient of thermal expansion of the substrate as per instant claim 1. Fujaski discloses a composite multilayer substrate comprising an electrode and dielectric layer formed on an electrically insulating substrate wherein the substrate has a coefficient of thermal expansion of 10.5 to 12.4 ppm/K as per instant claim 1 (see Figure 6, column 1, lines 33-49 and column 4, lines 1-68, and Table 1). The coefficient of thermal expansion of the substrate affects the insulation resistance. Therefore, it would have been obvious to one of ordinary skill in the art to have a coefficient of thermal expansion for the substrate to be between 10 and 20 ppm/K in order to reduce cracking in the dielectric layer and to reduce dielectric breakdown voltage as taught by Fujaski in column 1, line 65-column 2, line 2.

12. Claims 1,7 14-16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nunomura et al., U.S. Patent Number 4,757,235 in view of Fujaski et al., U.S. Patent Number 5,065,275 and in further view of Arai et al., U.S. Patent Number 6,340, 537.

Nunomura discloses an electroluminescent display device wherein the substrate portion comprises a ceramic base with internal wiring electrodes with a first insulating layer on a substrate with embedded electrodes as per instant claim 1 (see column 12, lines 55-63 and Figure 9). Column 13, lines 11-32 of the reference disclose a substrate having embedded electrodes with a first insulating layer, a luminescent layer on top of the first insulating layer, a second insulating layer with a second electrode layer on top of the second insulating layer as per instant claim 7. Nunomura discloses in column 13, lines 25-32 that the second electrode may be ITO as per instant claim 14. Nunomura does not disclose the coefficient of thermal expansion of the substrate as per instant claim 1. Fujaski discloses a composite multilayer substrate comprising

an electrode and dielectric layer formed on an electrically insulating substrate wherein the substrate has a coefficient of thermal expansion of 10.5 to 12.4 ppm/K as per instant claim 1 (see Figure 6, column 1, lines 33-49 and column 4, lines 1-68, and Table 1). The coefficient of thermal expansion of the substrate affects the insulation resistance. Therefore, it would have been obvious to one of ordinary skill in the art to have a coefficient of thermal expansion for the substrate to be between 10 and 20 ppm/K in order to reduce cracking in the dielectric layer and to reduce dielectric breakdown voltage as taught by Fujaski in column 1, line 65-column 2, line 2. Neither Nunomura nor Fujaski disclose the use of an IZO electrode or dopant as per instant claims 15-16 and 20. Arai teaches an organic electroluminescent device, which has an insulating layer (see abstract). The Arai reference also teaches that the secondary electrode can be zinc-doped indium oxide (IZO) as per instant claim 16 and has a proportion of 12-32 weight percent of ZnO mixed with indium oxide (see column 6, lines 57-68. Additionally, the Arai reference discloses that the second electrode can be tin-doped indium oxide (ITO) and has a proportion of 1-20 weight percent of tin oxide mixed with indium oxide as per instant claim 15 (see column 6, lines 57-68). The secondary electrode provides the luminescence necessary as a light emitting device. Therefore, it would have been obvious to one of ordinary skill in the art to use ITO and IZO in the above weight percentages as the secondary electrode in order to provide a light transmittance of at least 50% as shown by the Arai reference in column 7, lines 4-20.

13. Claims 1, 4, 14 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nunomura et al., U.S. Patent Number 4,757,235 in view of Fujaski et al., U.S. Patent Number 5,065,275 and in further view of Chung, U.S. Patent Number 5,352,622.

Nunomura discloses an electroluminescent display device wherein the substrate portion comprises a ceramic base with internal wiring electrodes with a first insulating layer on a substrate with embedded electrodes as per instant claim 1 (see column 12, lines 55-63 and Figure 9). Column 13, lines 11-32 of the reference disclose a substrate having embedded electrodes with a first insulating layer, a luminescent layer on top of the first insulating layer, a second insulating layer with a second electrode layer on top of the second insulating layer as per instant claim 7. Nunomura discloses in column 13, lines 25-32 that the second electrode may be ITO as per instant claim 14. Nunomura does not disclose the coefficient of thermal expansion of the substrate as per instant claim 1. Fujaski discloses a composite multilayer substrate comprising an electrode and dielectric layer formed on an electrically insulating substrate wherein the substrate has a coefficient of thermal expansion of 10.5 to 12.4 ppm/K as per instant claim 1 (see Figure 6, column 1, lines 33-49 and column 4, lines 1-68, and Table 1). The coefficient of thermal expansion of the substrate affects the insulation resistance. Therefore, it would have been obvious to one of ordinary skill in the art to have a coefficient of thermal expansion for the substrate to be between 10 and 20 ppm/K in order to reduce cracking in the dielectric layer and to reduce dielectric breakdown voltage as taught by Fujaski in column 1, line 65-column 2, line 2. Neither Nunomura nor Fujaski disclose the use of a dopant on the second electrode. Chung teaches a stacked capacitor with a thin film ceramic oxide layer. The Chung reference also discloses that the second electrode can be amorphous or polycrystalline silicon that has been doped as per instant claims 17-19 (see column 9, line 60-column 10, line 2). The silicon based electrode reacts at a higher temperature. Therefore, it would have been obvious to one of

ordinary skill in the art to use a silicon based second electrode in order to achieve greater stability of the EL device.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (703) 305-4488. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly, can be reached at (703) 308-0449. The fax phone number for the Group is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

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